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Dale C. Flanders

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EXAMINER

ABOAGYE, MICHAEL

ART UNIT

PAPER NUMBER

1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 09/645,827 | Applicant(s) FLANDERS ET AL. | |
| | Examiner MICHAEL ABOAGYE | Art Unit 1793 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-8,17,19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 1, 3-8, 17, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In view of the Appeal brief filed on October 16, 2008, PROSECUTION IS HEREBY REOPENED. As set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below

Means-Plus-Function Language

2. A claim limitation will be presumed to invoke 35 U.S.C. 112, sixth paragraph, if it meets the following 3-prong analysis:

(A) the claim limitations must use the phrase “means for” or “step for;”

(B) the “means for” or “step for” must be modified by functional language; and

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(C) the phrase “means for” or “step for” must not be modified by sufficient structure, material, or acts for achieving the specified function. (MPEP 2181)

Claim 17 states, “means for characterizing the positions of the optical components held by the mounting structures.....by plastic deforming....”. This limitation fails to satisfy the 3-prong analysis because the phrase “means for” is modified by sufficient acts for achieving the specified function. Therefore, 112 6th paragraph is not invoked.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3-8, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over (SPIE Vol. 2906, Microrobotics: Components and Applications) in view of Kang et al. (US Patent No. 6087621).

Wolfgang teaches a supply area (Figure 6, Stock); a pick and place machine that picks and places the components to the work area (abstract and Section 5, first paragraph); and an aligner that characterizes the positions of the components on the bench and mechanically adjusts the relative position (section 5.3, paragraphs 1-4); an aligner that activates/energizes a workpiece and detects an optical signal and adjusts the components (Section 5.3, Paragraphs 1-4 and Figure 9a, measuring system); and a two jaw gripper (Figure 9a, gripper). The examiner notes the structure of the optical

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system aligner is the gripper and the optical detector to detect the optical signal (see section 5.2). This limitation is taught by Wolfgang, as Wolfgang teaches an optical signal and optical detector to detect the optical signal and the jaws (see section 5.2-5.3).

Regarding the function language calling for characterizing the positions of the optical components after bonding. It is noted that Wolfgang discloses a corresponding structure which includes collimated laser beam and an optical sensing system already mounted on the reference plate allow the on-line alignment control of the optical element (figures 8 and section 5.2) that would be capable of characterizing the positions after bonding as well. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. >In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997), See MPEP 2114.

Wolfgang teaches the pick-and-place machine performing laser welding to bond the mounting structures to the benches but is silent on the pick-and-place machine performing solder bonding. However, solder bonding using a laser beam is known in the art. Therefore, it is the examiner's position that the apparatus of Wolfgang would be capable of (laser) soldering the mounting structures to the benches, which the claims do not exclude. (Rhee et al. US Patent No. 6,219,484 is cited as evidence to support the known technique of laser soldering). While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. >In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997), See MPEP 2114.

Wolfgang fails to teach mechanically adjusting the relative positions of the optical components by plastically deforming the mounting structures, which have been bonded to the optical benches by the pick-and-place machine.

Kang et al. provides the general teaching of it being known in the art that the phenomenon often referred to as the post weld shift (PWS) due to solidification shrinkage of the metal, when an optical component (optical fiber ferrule , 110, figure 5) positioned in a mounting structure (optical fiber support, 120, figure 5) is bonded (laser welded) to an optical bench (submodule substrate 140, figure 5), resulting in a weld shift leading to the reduction of both coupling efficiency and device throughput stability, and using a conventional hammering method such as a wrench for providing a mechanical force to the optical fiber ferrule 110 is employed and mechanically deforming (plastically deforming) the bonded structure to adjust the PWS in order to obtain good coupling efficiency (Kang et al., column 1, lines 44-column 2, lines 12). It should also be noted that the examiner is not relying on the entire invention of Kang et al. but only on him being evidence that use of hammering or mechanical/plastic deformation for obviating post weld shift is known in the art.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a mechanism (i.e. conventional hammer, such as a wrench) in the optical system aligner of Wolfgang to apply mechanical force to the bonded structures of Wolfgang thereby mechanically deforming (plastically deforming) the bonded structures which consequently adjusts the PWS thereby obtaining good coupling efficiency, as taught by Kang (Kang et al. , column 1, lines 44-column 2, lines 12).

Regarding claims 17, 19 and 20, Wolfgang teaches a supply area (Figure 6, Stock); a pick and place machine that picks and places the components to the work area (abstract and Section 5, first paragraph); and an aligner that characterizes the positions of the components on the bench and mechanically adjusts the relative position (section 5.3, paragraphs 1-4); an aligner that activates/energizes a workpiece and detects an optical signal and adjusts the components (Section 5.3, Paragraphs 1-4 and Figure 9a, measuring system); and a two jaw gripper (Figure 9a, gripper) and laser welding (abstract and Figure 4, laser).

Regarding the function language calling for characterizing the positions of the optical components after bonding. It is noted that Wolfgang discloses a corresponding structure which includes collimated laser beam and an optical sensing system already mounted on the reference plate allow the on-line alignment control of the optical element) that is used to characterize the positions of the structures before they are bonded. Therefore said structure would be capable of characterizing the positions after bonding as well. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. >In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997), See MPEP 2114.

Wolfgang teaches the pick-and-place machine performing laser welding to bond the mounting structures to the benches but is silent on the pick-and-place machine performing solder bonding. However, solder bonding using a laser beam is known in the art. Therefore, it is the examiner's position that the apparatus of Wolfgang would be capable of (laser) soldering the mounting structures to the benches, which the claims do

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not exclude. (Rhee et al. US Patent No. 6,219,484 is cited as evidence to support the known technique of laser soldering). While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. >In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997), See MPEP 2114.

Wolfgang fails to teach mechanically adjusting the relative positions of the optical components by plastically deforming the mounting structures, which have been bonded to the optical benches by the pick-and-place machine.

Kang et al. provides the general teaching of it being known in the art that the phenomenon often referred to as the post weld shift (PWS) due to solidification shrinkage of the metal, when an optical component (optical fiber ferrule , 110, figure 5) positioned in a mounting structure (optical fiber support, 120, figure 5) is bonded (laser welded) to an optical bench (submodule substrate 140, figure 5), resulting in a weld shift leading to the reduction of both coupling efficiency and device throughput stability, and using a conventional hammering method such as a wrench for providing a mechanical force to the optical fiber ferrule 110 is employed and mechanically deforming (plastically deforming) the bonded structure to adjust the PWS in order to obtain good coupling efficiency (Kang et al. , column 1, lines 44-column 2, lines 12). It should also be noted that the examiner is not relying on the entire invention of Kang et al. but only on him being evidence that use of hammering or mechanical/plastic deformation for obviating post weld shift is known in the art.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a mechanism (i.e. conventional hammer, such as a wrench) in the

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optical system aligner of Wolfgang to apply mechanical force to the bonded structures of Wolfgang thereby mechanically deforming (plastically deforming) the bonded structures which consequently adjusts the PWS thereby obtaining good coupling efficiency, as taught by Kang (Kang et al. , column 1, lines 44-column 2, lines 12).

Response to Arguments

5. The examiner acknowledges the applicants' amendment received by USPTO on October 27, 2008. Claims 1, 3-8, 17, 19 and 20 remain under consideration in the application.

6. Applicant's argue that Claims 1 and 17 are distinguishable over Wolfgang on two points. Applicant first argues that 1) Wolfgang fails to show or suggest the use of a pick-and-place machine for solder bonding components to the benches and 2) an aligner that characterizes the positions of the bonded components and then mechanically adjusts those bonded components by plastically deforming them.

In response, it is noted that Wolfgang teaches a UTH comprising: a robot that picks the components from the supply area (stock, figure 6), places the components on the benches, and then laser welds to components to the benches (abstract and Section 5, first paragraph). This structure satisfies the structure claimed with respect to Applicant's "pick-and-place machine."

Regarding the pick and place machine solder bonding the components to the bench, solder bonding using a laser beam is known in the art. Therefore, it is the examiner's position that the UTH of Wolfgang would be capable of (laser) soldering the mounting structures to the benches, which the claims do not exclude. (Rhee et al. US

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Patent No. 6,219,484 is cited as evidence to support the known technique of laser soldering). While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. >In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997), See MPEP 2114.

Regarding the function language calling for the optical aligner characterizing the positions of the optical components after bonding, it is noted that Wolfgang discloses a collimated laser beam and an optical sensing system already mounted on the reference plate for allowing on-line alignment control of the optical element) that is used to characterize the positions of the mounting structures before they are bonded. This structure would clearly be capable of characterizing the positions after bonding as well. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. >In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997), See MPEP 2114.

Applicant further argues that the applied references fail to disclose an optical system aligner that plastically deforms the bonded components.

In response, the examiner agrees with applicant's position. However, the newly applied reference to Kang et al. provides the general teaching of it being known in the art that the phenomenon often referred to as the post weld shift (PWS) due to solidification shrinkage of the metal, when an optical component (optical fiber ferrule , 110, figure 5) positioned in a mounting structure (optical fiber support, 120, figure 5) is bonded (laser welded) to an optical bench (submodule substrate 140, figure 5),

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resulting in a weld shift leading to the reduction of both coupling efficiency and device throughput stability, and using a conventional hammering method such as a wrench for providing a mechanical force to the optical fiber ferrule 110 is employed and mechanically deforming (plastically deforming) the bonded structure to adjust the PWS in order to obtain good coupling efficiency (Kang et al. , column 1, lines 44-column 2, lines 12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a mechanism (i.e. conventional hammer, such as a wrench) in the optical system aligner of Wolfgang to apply mechanical force to the bonded structures of Wolfgang thereby mechanically deforming (plastically deforming) the bonded structures which consequently adjusts the PWS thereby obtaining good coupling efficiency, as taught by Kang (Kang et al. , column 1, lines 44-column 2, lines 12).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ABOAGYE whose telephone number is (571)272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Assistant Examiner,
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